

Expanded Tables of the Atomic Electron  
Scattering Power According to a Statistical  
Theory Consistent With Electron Exchanges

75980  
SOV/70-4-5-2/36

$= 0$  to  $0.2 \cdot 10^{-8}$  are close approximations.  
Yermolayeva, A., is acknowledged for assistance in  
calculations. There is 1 table; and 6 references,  
3 Soviet, 3 U.S. The 2 published U.S. references are:  
Thomas, L. H., and Umeda, K., Journal Chem. Physic.,"  
26, 293, 1957; and Ibers, J. A., "Acta Crystallogr.,"  
11, 178, 1958.

ASSOCIATION: Institute of Crystallographical Institute  
of the Academy of Sciences of the USSR (Institute  
Kristallografiia AN SSR)

SUBMITTED: June 25, 1959

Card 2/2

24.7000

76005  
SOV/70-4-5-27/36AUTHORS: Vaynshteyn, B. K., Tatarinova, L. I.TITLE: Application of Strips for Integral Calculus of the  
Equation of a Curve of Radial Distribution

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 5, pp 782-784 (USSR)

ABSTRACT: The computation of the short-distance order in amorphous  
solids and liquids and a number of other structural  
problems necessitate the solution of the Fourier spheric  
integral; this can be accomplished by the method suggested  
by R. L. Harris, et al. The calculations can be con-  
siderably reduced if the integral expression is sub-  
stituted by the sum

$$F(r) = \sum_{s_k=0}^{s_k=s_{Max}} A(s_k) \frac{\sin s_k r_i}{s_k r_i} \Delta s_k,$$

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Application of Strips for Integral Calculus  
of the Equation of a Curve of Radial Dis-  
tribution

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which permits the use of strips based upon a principle similar to that of Beevers-Lipson strips. Having prepared a set of 20 strips for each value of  $s = 4\pi$   $(\sin v)/\lambda$  preselected with  $\Delta s = 0.2$  at the interval from 0.2 to 10, and  $\Delta r = 0.2$  Å at the interval from 0.2 to 9.0 Å, a radial distribution curve can be computed within 3 to 4 hours, while the integral calculus requires about 1 hour to find a single point of the curve. The same strips can be used if the function  $F(s)$  is calculated on the basis of  $A(r)$ . Thus, the intensity distribution curve can be computed on the basis of a trial model of the radial distribution function. The strips are also applicable for the computation of the first peak of Patterson functions and of the atomic scattering curves on the basis of the experimental or given electron density distributions. The strips have been used in a number of cases by the second author (Abstract 75987) and have furnished satisfactory results. There are three tables; and 5 references, 2 Soviet, 1 U.S., 1 U.K., 1 German. The

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Application of Strips for Integral Calculus  
of the Equation of a Curve of Radial Dis-  
tribution

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U.S. and U.K. references are: R. L. Harris, R. E.  
Wood, H. L. Ritter, J. Amer. Chem. Soc., 73, 3151-3155,  
1951; C. A. Beevers, H. Lipson, Philos. Mag., 17, 855-859  
1934.

ASSOCIATION: Crystallographical Institute of the Academy of Sciences  
of the USSR (Institut Kristallografiia AN SSSR)

SUBMITTED: June 19, 1959

Conf 2/2

0.0000

76012  
SOV/70-4-5-34/36

AUTHORS: Belov, N. V., Vaynshteyn, B. K., Kitaygorodskiy, A. I.,  
Poray-Koshits, M. A., Semiletov, S. A., Sheftal', N. N.

TITLE: International Fedorov Session on Crystallography Held in  
Leningrad

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 5, pp 796-800 (USSR)

ABSTRACT: The International Union of Crystallography (IUC) and the  
Academy of Sciences of the USSR convened an International  
Session (interim) on Crystallography commemorating the 40th  
anniversary of the death of the great Russian crystallo-  
grapher Ye. S. Fedorov. The session, attended by 600  
scientists from the USSR, U.K., France, U.S., Japan,  
Germany, Czechoslovakia, Netherlands, Canada, Australia,  
and other countries, was held in Leningrad from May 21  
to 27, 1959. The major reports were presented to the  
plenary sessions and some 100 reports to 2 panels. The  
subject of the 1st panel was crystal-chemical analysis  
and that of the 2nd panel electron was diffraction studies.

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International Fedorov Session on  
Crystallography Held in Leningrad

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The reports to the plenary sessions were presented by the following Soviet scientists: N. V. Belov (VP of IUC), V. I. Simonov, V. A. Frank-Kamenetskiy, G. B. Bokiy, M. A. Poray-Koshits, L. O. Atovmyan, G. N. Tishchenko, A. B. Ablov, T. I. Malinovskiy, Ye. A. Shugam, V. M. Levina, Yu. S. Terminasov, Sh. Kh. Yar-Mukhamedov, Ya. S. Umanskiy, V. I. Iveronova, L. S. Palatnik, V. A. Finkel', Ye. I. Gladyshevskiy, Z. G. Finsker, G. S. Zhdanov, A. S. Sonin, I. S. Zheludev, I. G. Ismailzade, I. S. Rez, A. V. Stepanov, I. B. Borovskiy, A. S. Povarennykh, Z. V. Zvonkova, A. I. Kitaygorodskiy, O. V. Stavrovskiy, N. N. Sandakova, N. M. Bashkirov, B. K. Vaynshteyn, I. M. Rumanova, V. L. Indenbom, I. I. Shafranovskiy, N. P. Trifonov, B. M. Shchedrin, D. M. Kheyker, M. M. Uman-skay, A. V. Shubnikov, V. F. Parvov, and V. V. Semenov. The reports of the U.S. crystallographers were presented by R. Pepinsky, D. Harker, W. H. Zachariasen, R. Randle, J. Donohue, G. Donnay, J. H. D. Donnay, and W. Parrish. Six reports were presented by British crystallographers, 2 by German, 2 by Czech, 2 by Dutch and 1 each by

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International Fedorov Session on  
Crystallography Held in Leningrad

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French, Canadian, and Japanese crystallographers. The session admitted five new member nations into IUC, confirmed its newly appointed officers, including the editor of "Acta Crystallographica," A. J. C. Wilson, appointed G. B. Bokiy as head of the subcommittee for abstracting the Soviet publications in crystallography, planned Japan to be the site of the next interim, and Italy or Israel of the next congress, and solved some other business matters.

SUBMITTED: July 1, 1959

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24.7100

77106  
SOV/70-4-6-7/31

AUTHOR: Vaynshteyn, B. K.

TITLE: Symmetry of Chain Molecules

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 6, pp 842-848  
(USSR)

ABSTRACT: Chains formed by certain structural motives (monomers), repeated in one direction, with or without relative twisting and bending, are considered from a purely geometrical point of view, i.e., without reference to the nature of interatomic bonds (single, double, ionic, Van der Waal's, etc.). The chains are allowed to have side functions but not branches. The twist and bend angles  $\varphi$  and  $\delta$ , combined in four possible ways, produce four types of chains (Fig. 2). If the alternating motives are mirror reflections of each other a staggered chain  $S_2(c)$  results due to glide-reflection without screw motion. Chain motives generally are asymmetrical. When

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## Symmetry of Chain Molecules

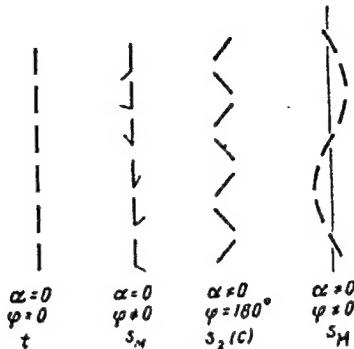
77106  
SOV/70-4-6-7/31

Fig. 2. Types of Chain Molecules.

symmetrical, the four types have numerous varieties. Except in pure-translation chains, motives are oriented differently. The chain symmetry is determined by both the axial motif and its side functions (isotactic polymers with lll- or ddd-type bonds, syndiotactic polymers with ldld-type bonds, polymers with

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.Symmetry of Chain Molecules

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irregularly situated side functions, etc.). The restricted number of possible bond positions limits the number of the classes of chain symmetry which in three-dimensional semicontinuums, as classified by A. V. Shubnikov (Simmetriya, Izd. AN SSSR, 1940) may occur in infinite numbers. The symmetry operations involve translation  $t$ , screw motion  $S_M$  that results from rotation to  $2\pi/M$  angle and from translation, and glide-reflection  $c$  in a plane containing the chain axis (glide component =  $t/2$ ).  $M$  can be any integer or a rational fraction of  $p/q$  type. If  $M = 1$  screw motion becomes identical to pure translation. All the possible combinations of symmetry operations including rotation  $N$  and rotary inverter  $\bar{N}$  produce 15 groups of chain symmetry compiled in Table 1. The groups are analyzed in detail and some compounds are mentioned as examples. The latter's chain symmetry coincides with one of the 15 groups, or more precisely with that of a variety with the definite values of  $N$ ,  $\bar{N}$ ,  $M$ , etc. There are 4 figures; 1 table; and 8

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## Symmetry of Chain Molecules

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Table 1. Symmetry groups of chain molecules.

OPERATIONS WITH TRANSLA- TION	POINT GROUPS							
	$C_N = N$	$D_N = N/2$	$C_{Nl} = \bar{N}$	$C_{Nh} = N/m$	$C_{Nv} = Nm$	$D_{Nd} = \bar{N}m$	$D_{Nh} = N/mmm$	
$t = S_1$	$tN$ $t$	$p$ $t/2$	$tN/2$ $t\bar{l}$	$p2$ $t\bar{l}^*$	$tN/m$ $t/m$	$pm$ $tNm$	$pmg$ $tNm^*$	$pmmm$ $t/mn$
$S_N$	$S_N N$ $S_N$	$p$ $S_N/2$	$S_N N/2$ $S_N/2$					
$S_{2N}$				$S_{2N} N/m$ $S_2/m$	$cm$	$cm$	$cm$	$cmm$
$C$	$cN$ $c$	$pg$	$c\bar{N}$ $c\bar{l}$	$pgg$ $c\bar{l}^*$	$cN/m$ $c/m$	$pmg$		$cN/mmm$ $c/mm$

Table 1. \* -  $N$  is an odd number or a multiple of 4; if  $\bar{N}$  is even the group passes into the next column as shown by arrows.

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Symmetry of Chain Molecules

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references, 3 U.K., 2 Soviet, 2 German, 1 Danish.  
The U.K. references are J. D. Bernal, Disc. Faraday  
Soc., 25, 7, 1958; C. W. Bunn, D. R. Holmes, Disc.  
Faraday Soc., 25, 95, 1958; International Tables for  
X-Ray Crystallography, Birmingham, 1952.

ASSOCIATION: Crystallographical Institute of the Academy of Sciences  
of the USSR (Institut kristallografi1 AN SSSR)

SUBMITTED: September 7, 1959

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24(2)

AUTHOR:

Vaynshteyn, B. K.

SOV/20-124-1-24/69

TITLE:

New Equations Which Connect Structural Factors (Novyye ravenstva, svyazivayushchiye strukturnyye faktory)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 1, pp 87-90 (USSR)

ABSTRACT:

The Fourier projections of the electron density of crystal structures are built up from the structural factors of the zero-networks  $L$  (or  $H$  or  $K$ ) = 0 of the inverse lattice:

$$\sigma_0(xy) = c \int_0^1 \rho(xyz) dz = \frac{1}{A} \sum_{hk} F_{hko} \exp[-2\pi i(hx + ky)].$$

This projection gives the position of all atoms. From the structural factors of a non-zero plane ( $L = \text{const} \neq 0$ ) it is possible to construct a conditioned (or, as it is called, a generalized) projection, so that

$$\sigma_L(xy) = c \int_0^1 \rho(xyz) \exp[2\pi i Lz] dz = \frac{1}{A} \sum_{hkL=\text{const}} F_{hkl} \exp[-2\pi i(hx + ky)]$$

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New Equations Which Connect Structural Factors

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holds. This function is in general complex:  $\mathcal{G}_L(xy) = \mathcal{G}_{\cos L}(xy) + i\mathcal{G}_{\sin L}(xy)$ , where  $\mathcal{G}_{\cos(\sin)L}(xy) = c \int_0^1 \mathcal{G}(xyz) \cos(\sin)2\pi Lz dz$  holds. Each atom  $j$  is in the conditioned projection at the same place as in the ordinary projection; the differences compared to ordinary projection are pointed out. Although the structural factors entering into the Fourier series for  $\mathcal{G}_0(xy)$  and  $\mathcal{G}_L(xy)$  are totally different from each other, the functions determined in this connection nevertheless have similar properties. This similarity can be rendered nearly complete. It was shown in some papers that it is possible, from a non-zero plane of an inverse lattice, to construct a projection that is analogous to the zero projection, i.e. the so-called modulus projection. The author here investigates the special case in which the atoms do not overlap on the projection, or the equivalent case in which they do overlap, but in which the vertical distance between them is small compared to the half-life  $c/2L$  of the harmonic

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New Equations Which Connect Structural Factors

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$\cos(\sin)2\pi Lz$ . In practice, this case occurs rather often, especially if one of the lattice periods is not great. In the case under investigation the modulus projection and the zero projection are identical. The here derived equations hold for the general case in which there is no symmetry center, and they then give a connection between the phases, and, if there is a symmetry center, a connection between the signs. The author then investigates various possibilities of applying the equations derived. There are 5 references, 4 of which are Soviet.

ASSOCIATION: Institut kristallografii Akademii nauk SSSR (Institute for Crystallography of the Academy of Sciences, USSR)  
PRESENTED: September 5, 1958, by N. V. Belov, Academician  
SUBMITTED: September 5, 1958

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S/070/60/005/003/009/024/XX  
E132/E460

AUTHOR: Vaynshteyn, B.K.

TITLE: The Antisymmetry of Fourier Transforms of Figures  
Which Each Have a Special Point

PERIODICAL: Kristallografiya, 1960, Vol.5, No.3, pp.341-345

TEXT: A one to one correspondence, determined by the Fourier transform, between the symmetry point groups and certain anti-symmetry point groups and the connection between the latter and the Laue classes has been established. The concept of anti-symmetry, introduced by Shubnikov, permits the description of the symmetry of objects, which are congruent, either identically or after reflexion, but opposite in the sign of some property. Antisymmetry is the natural method of describing the symmetry of distributions given as functions of a complex variable. Various functions occurring in the representation of crystals by electron density distributions in crystal structure analysis are usefully described in this way. In particular the Fourier transform of the electron density is a complex function. Its real and imaginary parts may be symmetrical or antisymmetrical in various ways in different point groups. Tables are given of the point

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S/070/60/005/003/009/024/XX  
E132/E460

The Antisymmetry of Fourier Transforms of Figures Which Each Have  
a Special Point

groups and the antisymmetry point groups which correspond to each of the 11 Laue classes. The analysis given is only for point groups - an extension to space groups cannot be made automatically but each case must be separately examined and this will be done in a later paper. Here one definite antisymmetry group corresponds to each symmetry point group after the latter is transformed. There are 2 tables and 7 references: 5 Soviet and 2 English.

ASSOCIATION: Institut kristallografii AN SSSR  
(Institute of Crystallography AS USSR)

SUBMITTED: February 28, 1960

Card 2/2

DVORYANKIN, V.F.; VAYNSHTEYN, B.K.

Electron diffraction study of thiourea. Kristallografiia 5 no.4;  
589-599 J1-Ag '60. (MIRA 13:9)

1. Institut kristallografiia AN SSSR i Institut neorganicheskoy khimii  
Sibirskogo otdeleniya AN SSSR.  
(Urea--Diffraction)

ALEXANDROV, R. A., Institute for Physical Friction  
 Institut S. I. Vavilov, Academy of Sciences USSR,  
 Moscow - "Metronegraphic study of  $\text{MnCO}_3$ "  
 (Section J-2)

BAKOV, N. V., Associate Director, Institute of  
 Crystallography, Academy of Sciences USSR, Moscow -  
 "Magnetic (ferromagnetic) space group symmetry"  
 (C-6)

BAKOV, N. V., KONTOV, N. N., Both Institute of  
 Crystallography, Academy of Sciences USSR, Moscow,  
 Baltimore, Md., and BAKOV, N. N., Geophysical  
 Laboratory, Carnegie Institution, Washington, D. C.,  
 "Tables of magnetic space groups, II. Special  
 positions" (C-6)

BOROVITS, N. A., Institute for Physics  
 USSR - "Antiferromagnetic resonance in carbonated  
 of transition elements" (list) (K-16)

BOROVITS, N. A., A. S., ALEXANDROV, G. G.,  
 RUMASHEVSKY, G. M., "Piezoelectric effect in  
 antiferromagnetic" (N-18)

BORODIN, G. I., Head, Magnetic Laboratory,  
 Moscow State University - (1) "The electric and  
 galvanoelectric properties of thin filaments at very  
 low temperatures (I-5); (2) "On the estimation of current  
 densities in pseudosusceptible magnetisation of current  
 carriers" (N-18); (3) "Electron diffraction in  
 carbonated of transition elements" (list) (K-16)

BORODIN, G. I., and VYATKIN, V. I., Institute of  
 Crystallography, Academy of Sciences USSR - "Electron diffraction  
 study of thoria" (K-12)

BYAKOV, B. G., Central Scientific Research  
 Institute of Metallurgy, Moscow - "The problem  
 of the influence of spontaneous magnetisation on  
 crystal structure and phase state of alloys" (K-8)

CHASIN, B. G., ALEXANDROV, D. P., KERZNER, I. M., ABOV, Yu. G.,  
 USSR Central Scientific Research Institute of  
 Metallurgy, Moscow - "Neutron diffraction  
 investigation of order-disorder in the alloys  
 permalloy and ferrimagnetic cobalt" (J-1)

CHIBOV, R. P., BOKH, V. S., TIMUR, G. S.,  
 Scientific Research Physico-Chemical Institute  
 of Metalurgy, Moscow - "Neutron diffraction  
 study of the structure of solid hydrogen and  
 deuterium" (C-8)

CHIKUB, Z. G., Institute of Crystallography,  
 Academy of Sciences USSR, Moscow - "Results and progresses  
 of electron diffraction analysis" (J-1)

CHIKUB, Z. G., Institute of Semiconductors  
 and Magnetic Research Institute of  
 Metallurgy, Moscow - "Magnetic anisotropy in  
 semiconductors of Mn-Fe-Cu alloys" (K-9)

CHIKUB, Z. G., Scientific Research Institute of the  
 Metallurgy, Moscow - "Some problems of the  
 physics of high coercive materials" (N-17)

CHIKUB, Z. G., Institute of Semiconductors  
 and Magnetic Research Institute of  
 Metallurgy, Moscow - "On layered and of non-metallic  
 ferromagnetic intergrowths" (N-12)

CHIKUB, Z. G., Institute of Crystallography,  
 Academy of Sciences USSR - "Development of electron  
 diffraction method" (C-11)

DANILOV, I. I., BELYI, N. V., ERMIN, Y. Z., Institute  
 of Crystallography, Moscow - "Atomic and magnetic  
 structures of manganese ferrite" (K-2)

VYASOVSKIY, S. V., Institute of the Physics of Metals,  
 Academy of Sciences USSR, Director, a member  
 of the IUPAP Commission on Magnetism. See  
 paragraph 1 of document for a complete listing of  
 members of the commission. "Some investigations  
 of Soviet physics on the theory of ferromagnetism  
 for the last years" (Invited paper. Section K-11)

paper to be submitted for the IUPAP Int'l. Conference on Magnetism and  
 Crystallography, Kyoto, Japan, 29-30 Sep 1961

KITAYGORODSKIY, A.I.; VAYNSHTEYN, B.K.; RUMANOVA, I.M.; ZVONKOVA, Z.V.

Theory and practice of direct methods in the structure analysis  
of crystals. Zhur.strukt.khim. 2 no.5:622-639 S-0 '61. (MIRA 14:11)

1. Institut elementoorganicheskikh soyedineniy AN SSSR,  
Institut kristallografii AN SSSR i Fiziko-khimicheskiy institut  
imeni L.Ya. Karpova.

(Crystallography)

LOBACHEV, A.N.; VAYNSHTEYN, B.K.

Electron diffraction study of urea. *Kristallografiia* 6 no.3:  
395-401 My-Je '61. (MIRA 14:8)

1. Institut kristallografi AN SSSR.  
(Electron diffraction examination) (Urea)

24.720025891  
S/070/61/006/004/003/007  
E032/E314

AUTHORS: Talybov, A.G. and Vaynshteyn, B.K.

TITLE: Electron-diffraction Study of the Structure of  
 $PbBi_4Te_7$ PERIODICAL: Kristallografiya, 1961, Vol. 6, No. 4,  
pp. 541 - 548TEXT: The phase diagram of the system  $SnTe$  -  $Sb_2Te_3$  and  
 $PbTe$  -  $Bi_2Te_3$  was investigated by Yelagina and Abrikosov, N.Kh.  
(Ref. 1 - Zh. neorgan. khimii 4, 7, 1638 - 1642, 1959). The  
compound  $SnSb_2Te_4$  was found in the first system and the  
structure was investigated by electron-diffraction methods  
by the present author in Ref. 2 (Talybov - Kristallografiya,  
6, 1, 63-69, 1961). According to Ref. 1, the second system  
also contained only a single compound,  $PbBi_4Te_7$  =  $PbTe \cdot 2Be_2Te_3$ .  
The structure of the latter compound was investigated in the  
work now reported. This compound corresponds to an alloy

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Electron-diffraction Study ....

containing 82.7%  $\text{Bi}_2\text{Te}_3$  and 17.3% PbTe. Measurements showed (Ref. 1) that this compound had a conductivity of about  $1700 \Omega^{-1}\text{cm}^{-1}$ , a thermo-electric power of  $31 \mu\text{V}/\text{deg}$  and is apparently a semiconductor. The presence of  $\text{PbBiTe}_7$  was confirmed in Ref. 1 by X-ray analysis. In the present work, the  $\text{PbBi}_4\text{Te}_7$  compound was prepared by a vacuum distillation onto a sufficiently cleaved NaCl face. Three types of electron-diffraction patterns were obtained, depending on the method of annealing. The patterns were similar insofar as the position and intensity of strong reflections were concerned but different in the weak reflections. The elementary cells derived from these photographs were all hexagonal and their periods were found to be

I	$a = 4.50 \pm 0.02 \text{ \AA}$ ,	$c = 17.6 \pm 0.05 \text{ \AA}$ ,
II	$a = 4.44 \pm 0.02 \text{ \AA}$ ,	$c = 71.7 \pm 0.2 \text{ \AA}$ ,
III	$a = 4.44 \pm 0.02 \text{ \AA}$ ,	$c = 107.4 \pm 0.3 \text{ \AA}$ .

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Electron-diffraction Study ....

It was established that these three phases could be looked upon as different degrees of ordering of the same phase, i.e. as superstructures relative to structure I. The present paper reports results obtained for structure I, which is obtained by evaporating the substance onto a base heated to 80 - 100 °C, with subsequent annealing at about 200 °C for one hour. The possible space groups were found to be

$D_{3d}^3$  -  $P\bar{3}ml$ ,  $D_3^2$  -  $P321$ ,  $C_{3i}^1$  -  $P\bar{3}$  and  $C_{3v}^1$  -  $P\bar{3}ml$ .

The final identification is :

$$a = 4.50 \pm 0.02 \text{ \AA};$$

$$c = 17.6 \pm 0.05 \text{ \AA};$$

$$D_{3d}^3 - P\bar{3}ml.$$

The structure is based on a 10-layer packing in which the Pb atoms are statistically distributed in 4 layers, together with

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Electron-diffraction Study ....

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the Te atoms with 3/16 Pb and 13/16 Te. The number of formula units of  $PbBi_4Te_7$  per elementary cell is 3/4. Acknowledgments to Ye.I. Yelagina and Professor N.Kh. Abrikosov, who supplied the specimens. There are 4 figures, 1 table and 8 Soviet references.

ASSOCIATION: Institut khimii AN AzerbSSR (Institute of Chemistry of the AS AzerbSSR)  
Institut kristallografii AN SSSR (Institute of Crystallography of the AS USSR)

SUBMITTED: December 3, 1960

Card 4/4

VAYNSHTEYN, B.K.; LOBACHEV, A.N.

Dynamic scattering and its application in electron diffraction  
structure studies. Kristallografiia 6 no.5:763-766 S-0 '61.

1. Institut kristallografiia AN SSSR.  
(Electrons--Scattering) (Electron diffraction examination)  
(MIRA 14:10)

24.2200 1160 1164 1137

15.8091

30174  
S/070/61/006/006/006/008  
E132/E135

AUTHORS: Dvoryankin, V.F., and Vaynshteyn, B.K.

TITLE: An electron diffraction study of the structure of the  
low-temperature ferroelectric phase of thiourea

PERIODICAL: Kristallografiya, v 6, no.6, 1961, 949-959

TEXT: G.J. Goldsmith and J.G. White (Ref.7: J. Chem. Phys., Vol.31, 1175-1187, 1959) have shown that there are 5 phases of thiourea: I ferroelectric (f.e.) up to 169 °K; II anti-ferroelectric (a.f.e.) 169-176 °K; III f.e. 176-180 °K; IV a.f.e. 180-202 °K; V a.f.e. above 202 °K. They also found the positions of the heavy atoms in phase I by X-ray methods simultaneously with the present authors who used electron diffraction methods. A detailed structural study at 133 °K has now been made, (Ref.6: Kristallografiya, Vol.4, 6, 925, 1959). The unit cell has the space group  $Pb_{21}m = C_{2v}^2$  with  $Z = 4$  and much the same dimensions as at room temperature, although the space group then is  $D_{16}^{2h}$ . Oblique texture photographs were taken at 133 °K and spot intensities were measured to about 15% Card 1/3

An electron diffraction study of the... <sup>30174</sup> S/070/61/006/006/006/008  
E132/E135

for 6 layer lines. 250 reflexions were measured (188 at room temperature). Phases were calculated for a trial structure including H atoms. Corrections for dynamic effects were necessary. An anisotropic temperature factor was introduced and a reliability factor of 18% was finally obtained. Various Fourier sections, projections and difference syntheses were constructed. Coordinates of the atoms were found from these and are compared with those of Goldsmith and White who only estimated the H positions from standard bond lengths and angles. The correspondence is very close. The H-bonding system and the nature of the ferroelectric transition are discussed. On the basis of the non-planarity of the molecules when ferroelectric mechanisms are suggested for the phases II, III and IV. Acknowledgments are expressed to F.A. Brusentsov for his assistance. Z.V. Zvonkova and Yu. Tashpulatov are mentioned in connection with their contributions to the study of the structure of thiourea. X

There are 7 figures, 2 tables and 23 references: 11 Soviet-bloc and 12 non-Soviet-bloc. The four most recent English language  
Card 2/3

30174

An electron diffraction study of the... S/070/61/006/006/006/008  
E132/E135

references read as follows:

Ref. 7: as in text above.

Ref.13: G.A. Jeffrey, R. Shino. Acta crystallogr., Vol.12,  
447-455, 1959.

Ref.19: Costain, Downing. J. Chem. Phys., Vol.32, 158, 1960.

Ref.23: Chiba, M. Toyama, I. Morino. J. Phys. Soc. Japan,  
Vol.14, 379-380, 1959.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya  
AN SSSR (Institute of Inorganic Chemistry, Siberian  
Filial AS USSR)

Institut kristallografi AN SSSR (Institute of  
Crystallography, AS USSR)

SUBMITTED: August 18, 1961

Card 3/3

VAYNSHTEYN, B.K.

Empirical law of scattering in structural electron diffraction study. Kristallografiia 6 no.6:965-967 N-D '61.  
(MIRA 14:12)

1. Institut kristallografi AN SSSR.  
(Scattering(Physics))  
(Electron diffraction examination)

VAYNSHTEYN, B.K.; PINSKER, Z.G.; LOBACHEV, A.N.; ZVYAGIN, B.B.

Important problems in the theory of modern electron-diffraction structure study; survey. Zav.lab. 27 no.6:673-682 '61. (MIRA 14:6)

(Electron diffraction examination)

BELOV, N.V., akademik; VAYNSHTEYN, B.K., doktor fiz.-matem.nauk

Tendencies in the development of modern crystallography;  
results of the Fifth International Congress on Crystal-  
lography. Vest. AN SSSR 31 no.4:99-104 Ap '61.

(Crystallography--Congresses)

(MIRA 14:4)

VAYNSHTEYN, B.K.; TATARINOVA, L.I.

Electron diffraction study of poly- $\gamma$ -methyl L-glutamate.  
Dokl. AN SSSR 139 no.6:1347-1350 Ag '61. (MIRA 14:8)

1. Institut kristallografii AN SSSR. Predstavлено академиком  
N.V. Belovym.

(Electron diffraction examination)  
(Glutamic acid)

24.7100 1460, 1136, 11582

27877

S/020/61/140/001/013/024  
B104/B109AUTHORS: Vaynshteyn, B. K. and Dvoryankin, V. F.

TITLE: Mechanism of a ferroelectric phase transformation in thiocarbamide at 133° K

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 1, 1961, 111-114

TEXT: The character of C - S bond in thiocarbamide ( $\text{CS}(\text{NH}_2)_2$ ) has been studied repeatedly. In previous papers the authors described structural analyses of thiocarbamide by means of electron diffraction studies. (Kristallografiya, 4, 925, (1959); 5, 589 (1960); 11, 504 (1958)). Similar studies were made by G. J. Goldsmith et al. (J. Chem. Phys., 31, 1175 (1959)) who proved the existence of five phases. Using the terminology introduced by Goldsmith, the authors proved a phase transition at 133° K in the ferroelectric phase I which exists below 169° K. In the anti-ferroelectric phase V which exists above 201° K they electronographically localized the position of a hydrogen atom. The structural formula of

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S/020/61/140/001/013/024  
B104/B109

Mechanism of a ferroelectric ...

phase V of thiocarbamide which is shown in Fig. 1 is discussed at length. A three-dimensional representation of the potential levels is made for exactly determining the hydrogen atoms in the phases I and V. It could be proved for both phases that the H<sup>II</sup> atom does not lie in the same plane as the other heavy atoms. It is suspected that in all five phases of thiocarbamide this hydrogen atom does not lie in the plane of the other atoms. In a detailed study of the structural change of thiocarbamide in a ferroelectric phase transition it is demonstrated that the ferroelectric properties of phase I result from the unevenness of its molecule and from the formation of strong hydrogen bonds at low temperatures. The molecules of phase I are less symmetric than those of phase V. Finally, the authors discuss possible variants of the structure of the phases II, III, and IV of thiocarbamide. Z. V. Zvonkova and Yu. Tashpulatov (Kristallografiya, 3, 553 (1958)) are mentioned. There are 3 figures and 16 references: 7 Soviet and 9 non-Soviet. The references to English-language publications read as follows:

Card 2/4

27877

Mechanism of a ferroelectric ...

S/020/61/140/001/013/024  
B104/B109

N. R. Kunchur at al., J. Chem. Soc., 1958, July (517), 2551; P. Vaughan, et al., Acta Cryst., 5, 532 (1954); H. J. Grenville-Wells, Acta Cryst., 2, 709 (1956); J.W. Emsley at al., Arch. Sci., 12, 122 (1959).

ASSOCIATION: Institut kristallografii Akademii nauk SSSR  
(Institute of Crystallography of the Academy of Sciences  
USSR)

Institut neorganicheskoy khimii Sibirskogo otdeleniya  
Akademii nauk SSSR  
(Institute of Inorganic Chemistry of the Siberian Department  
of the Academy of Sciences USSR)

SUBMITTED: April 29, 1961, by N. V. Belov, Academician  
April 24, 1961

Card 3/4

TATARINOVA, L.I.; VAYNSHTEYN, B.K.

Electron diffraction study of the  $\alpha$ -form of poly-  $\gamma$ -methyl-L-glutamate. Vysokom. soed. 4 no.2:261-269 F '62. (MIRA 15:4)

1. Institut kristallografi AN SSSR.  
(Glutamic acid) (Electron diffraction examination)

S/070/62/007/001/004/022  
E132/E460

AUTHORS: Talybov, A.G., Vaynshteyn, B.K.

TITLE: The electron diffraction structure analysis of the superstructure II of the alloy  $PbBi_4Te_7$

PERIODICAL: Kristallografiya, v.7, no.1, 1962, 43-50 + 1 plate

TEXT: The superstructure II of  $PbBi_4Te_7$  has a hexagonal cell with  $a = 4.44$  and  $c = 71.7 \text{ \AA}$  with the space group  $P\bar{3}ml$ . It is a 36 layer cubic packing made up of 4 packets of 9 layers. The packets differ in the positions of the Pb atoms which occupy statistically two layers in each packet. The phase II was obtained by evaporating the alloy on to a NaCl substrate at room temperature and annealing at  $200^\circ\text{C}$  for 40 min. Oblique texture electron diffraction patterns were obtained, all strong reflections corresponding to phase I (ibid. v.6, no.4, 1961). Weak reflections gave a c-period 4 times that of phase I. The structure analysis was carried out by  $F^2$  and  $F$  series summations, corrections for dynamic effects being applied to the observed intensities. The most information was obtained from the section  $(00z)$  which showed the differences between the 9 layer packets.

Card 1/2

✓

The electron diffraction ...

S/070/62/007/001/004/022  
E132/E460

A diagram showing the layer sequence is given. There are 3 layers of Bi, 4 layers of Te and 2 layers where Te and Pb are statistically mixed per packet of 9 layers. A reliability factor of 22% was achieved. All peaks were almost exactly in the ideal structure positions,  $z$  being always a multiple of  $1/36$ . There are 6 figures.



ASSOCIATIONS: Institut khimii AN AzerbSSR  
(Institute of Chemistry AS Azerbaydzhanskaya SSR)  
Institut kristallografii AN SSSR  
(Institute of Crystallography AS USSR)

SUBMITTED: April 24, 1961

Card 2/2

34759

S/020/62/142/003/027/027  
B144/B101

27/220

AUTHORS: Nikolayeva, N. V., Kruglyakova, K. Ye., Kiselev, N. A.,  
Vaynshteyn, B. K., and Emanuel', N. M., Corresponding  
Member AS USSR

TITLE: Reduction of radiation damage of DNA molecules in the  
presence of propyl gallate (PG)

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 3, 1962, 713-715

TEXT: The present study concerns the protective effect of PG on 0.007% DNA solutions which were prepared from the spleen of rats and diluted in 0.1 M ammonium acetate, pH 6.2, to 0.0015%. The intrinsic viscosity  $[\eta]$  of 25 dl/g corresponds to a molecular weight of  $\sim 3 \cdot 10^6$ , the coefficient of molar extinction  $\epsilon_{(r)260 \text{ m}\mu} = 6450$ . Doses of 66,000, 168,000, and 336,000 r were applied with a  $\text{BF-2}$  (BF-2) short focus x-ray test apparatus (8 ma, 75 kv, Mo anode, without filter), dose intensity 135,000 r/min. One-stage carbon replicas were examined in an IEM-5G electron microscope, accelerating tension 80 kv, magnification 18-25,000 times. The damage

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Reduction of radiation damage...

S/020/62/142/003/027/027  
B144/B101

percentage increases from 50 through 75 to 100% after irradiation doses in the above-mentioned sequence. In all cases, addition of PG guarantees a 40 - 50% protection of DNA molecules (Fig. 1). The size of the DNA molecule fragments is greater with PG addition than without. Further studies are needed to decide whether these fragments are incompletely decomposed molecules of the initial DNA or a result of cross-linking facilitated by PG. PG addition after irradiation and testing of DNA and PG as to their biological activities may solve this problem. There are 2 figures and 19 references: 8 Soviet and 11 non-Soviet. The four most recent references to English-language publications read as follows: A. R. Peacocke, B. N. Preston, Proc. Roy. Soc., Ser. B, 153, No. 950, 90 (1960); R. Latarjet, H. Ephrussi-Taylor, N. Rebeyrotte, Radiation Res., Suppl. 1, 417 (1959); F. M. Defilippes, W. R. Guild, Radiation Res., 11, 38, (1959); P. Alexander, K. A. Stacey, IV Internat. Congress of Biochemistry, Vienna, 1 - 6 Sept., Symp. IX, 1958. X

SUBMITTED: September 30, 1961

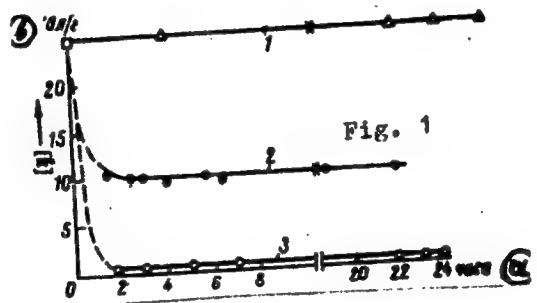
Card 2/3

Reduction of radiation damage...

S/020/62/142/003/027/027  
B144/B101

Fig. 1. Change in intrinsic viscosity of DNA solutions before and after x-ray irradiation.

Legend: (1) control (before irradiation); (2) irradiation with PG addition; (3) irradiation without PG; (a) hours; (b) dl/g.



Card 3/3

VAYNSHTEYN, Boris Konstantinovich; KITAYGORODSKIY, A.I., prof.,  
otv. red.; FEYGIN, L.A., red.izd-va; PRUSAKOVA, T.A.,  
tekhn. red.

[Diffraction of X-rays by chain molecules] Difraktsiia rent-  
genovykh luchei na tseplykh molekulakh. Moskva, Izd-vo  
Akad. nauk SSSR, 1963. 371 p. (MIRA 16:7)  
(Polymers) (X-ray diffraction examination)

VAYNSHTEYN, B.K.; ZVYAGIN, B.B.

Mapping of a crystal lattice in reciprocal symmetry space.  
Kristallografiia 8 no.2:147-157 Mr-Ap '63. (MIRA 17:8)

1. Institut kristallografi AN SSSR, i Vsesoyuznyy nauchno-  
issledovatel'skiy geologicheskiy institut.

GURSKAYA, G.V.; VAYNSHTEYN, B.K.

Crystalline structure of hydrochloric l-phenylalanine and  
determination of its model. Kristallografiia 8 no.3:368-373  
My-Je '63. (MIRA 16:11)

1. Institut kristallografi AN SSSR.

CHISTYAKOV, I.G.; VAYNSHTEYN, B.K.

Structure of *o*-benzolazo-(anisal- $\alpha$ -naphthylamine) in a vitrified liquid crystalline state. Kristallografiia 8 no.4:570-577 Jl-Ag '63. (MIRA 16:9)

1. Institut kristallografi AN SSSR.  
(Naphthylamine) (Liquid crystals)

VAYNSHTEYN, B.K.

Problems of crystallography. Vest. AN SSSR 33 no.6:31-38 Je  
'63. (MIRA 16:7)

1. Chlen-korrespondent AN SSSR.  
(Crystallography)

VAYNSHTEYN, B.K.; GEL'FAND, I.M.; KAYUSHINA, R.L.; FEDOROV, Yu.G.

Use of the R-factor minimization method in determining  
crystal structures. Dokl. AN SSSR 153 no.1:93-96 N '63.

(MIRA 17:1)

1. Chleny-korrespondenty AN SSSR (for Vaynshteyn, Gel'fand).

VORONOVA, A.A.; VAYNSHTEYN, B.K.

Electron diffraction study of the crystalline structures of  
 $PbCO_3PbO \cdot 2H_2O$ . Kristallografiia 9 no.2:197-203 Mr-Ap'64.

(MIRA 17:5)

1. Institut kristallografiia AN SSSR.

VAYNSHTEYN, B.K.

Contribution of orientation to the scattering intensity of  
molecular crystals. Kristallografiia 9 no.2:162-166 Mr-Apr'64.  
(MIRA 17:5)

1. Institut kristallografii AN SSSR.

VAYNSSTEYN, B.K.; FEYGIN, L.A.

Ordered arrangement of the molecules of soluble ribonucleic acid in water solutions. Dokl. AN SSSR 161 no.6:1444-1447  
Ap '65. (MIRA 12:5)

1. Institut kristallografi AN SSSR. 2. Chlen-korrespondent AN SSSR (for Vaynshteyn).

L 09460-67 EWT(1)/EWT(m)/EWP(j) RM  
ACC NR: AP6024665

SOURCE CODE: UR/0070/66/011/004/0526/0535

46  
46

B

AUTHOR: Vaynshtoyn, B. K.; Kayushina, R. L.

ORG: Institute of Crystallography AN SSSR (Institut kristallografii AN SSSR)

TITLE: Distribution of intensities of x-ray reflections and the information contained in them

SOURCE: Kristallografiya, v. 11, no. 4, 1966, 526-535

TOPIC TAGS: x-ray crystallography, crystal structure analysis, atomic structure, crystal symmetry, statistic distribution, organic crystal

ABSTRACT: The authors derive on the basis of the known expressions for the mean value of the intensity for a given angle and the known Wilson formulas for the statistical distribution of the observed intensities of x-ray patterns as a function of the number and species of atoms in each cell, in the presence and absence of a symmetry center. The comparison of the calculated distributions with the experimental ones for a number of structures has shown satisfactory agreement. The choice of the minimum number of reflections, such as to contain the largest information concerning on the structure, using in particular the method of nonlocal

Card 1/2

UDC: 548.734

L 09460-67  
ACC NR: AP6024665

search, is described and is shown to yield a preliminary model of the structure. The measure of the information is taken to be the sum of the intensities of the reflections used to determine the structure (as a fraction of the total sum of the intensities). The calculated distribution of the observed intensities can be used to determine beforehand the fraction of information contained in a limited number of strongest reflections (exceeding a certain value). Calculations made for organic structures have shown that 15 -- 20% of the strongest reflections contain up to 70% of the information, which is more than sufficient for determining the preliminary model of the structure. The corresponding formulas were calculated for a number of organic structures by means of an electronic computer (L-proline L-oxyproline, DL-serine, phenanthrene, and l-naphthoquinone). Orig. art. has: 7 figures, 3 tables, and 19 formulas.

SUB CODE: 20/      SUBM DATE: 22Feb66/      ORIG REF: 005/      OTH REF: 015

Card 2/2 LC

ACC NR: AP7000002

SOURCE CODE: UR/0070/66/011/006/0921/0923

AUTHOR: Vaynshteyn, B. K.; Kosourov, G. I.

ORG: Institute of Crystallography AN SSSR (Institut kristallografii AN SSSR)

TITLE: The laser as a source for optical Fourier transform

SOURCE: Kristallografiya, v. 11, no. 6, 1966, 921-923

TOPIC TAGS: Fourier transform, x ray diffraction pattern, laser application, laser emission coherence

ABSTRACT: The laser beam is discussed as a source of coherent illumination in the preparation of optical transforms. The high monochromaticity of laser emission and the brightness and spatial coherence of the beam eliminate the present need for a small aperture diaphragm, making it possible to obtain brighter, sharper, and more detailed diffraction patterns which can be studied visually on a screen or easily photographed. The optical system used comprises the gas laser LG-35K, a microobjective for enlarging the beam to the dimensions of the mask, and a projection objective with the mask fixed in front and with a screen or a fixed-focus camera without an objective positioned in its focal plane. Ocular magnification of the diffraction pattern can be obtained by including one additional lens in the system. No special measures are required for selecting a single laser oscillation mode. Any

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UDC: 548.0

ACC NR: A1700002

object, including photographic masks with a periodic structure, can generally be used as the diffracting model. Transparency and uniformity requirements for photographic masks are not as rigid when using a laser source. Nonuniformities in the photographic masks can lead to phase and amplitude modulation of the light field directly beyond the mask, but this phenomenon can be overcome to a large extent by the use of oil immersion. Information on phases of the diffraction beams can be obtained by shifting them from the original and studying the corresponding patterns in the focal and in intermediate planes. The principle of "shifting" might be used to introduce phases in the diffraction from masks simulating a reciprocal lattice, and to thereby obtain optical Patterson synthesis and also Fourier synthesis of a crystal structure. "The authors thank A. V. Shubnikov and V. F. Parvov for supplying the photo masks they used earlier in studying solution optics phenomena, and also N. A. Kiselev, to whom the electron microphotograph of catalase belongs." Orig. art. has: 4 figures. [06]

SUB CODE: 20 / SUBM DATE: 30May66 / OTH REF: 004 / ATD PRESS: 5109

Card 2/2

MILLIONSHCHIKOV, M.D., akademik; ARUTYUNOV, K.B.; NESMEYANOV, A.N., akademik; TAL'ROZE, V.L., doktor khim.nauk; PAVLENKO, V.A.; KOTEL'NIKOV, V.A., akademik; PETROV, B.N., akademik; NOVIKOV, I.I.; MANDEL'SHTAM, S.L., doktor fiz.-matem.nauk; VAYNSHTEYN, B.K.; SHUMILOVSKIY, N.N., akademik

Problems in the manufacture of scientific instruments. *Vest.AN SSSR*  
35 no.6:3-20 Je '65. (MIRA 18:8)

1. Glavnyy konstruktor Spetsial'nogo konstruktorskogo byuro analiticheskogo priborostroyeniya (for Pavlenko). 2. Chleny-korrespondenty SSSR (for Novikov, Vaynshteyn). 3. AN Kirgizskoy SSR (for Shumilovskiy).

VAYNSHTEYN, P.K.

Effect of the rotation of chain molecules on the diffraction  
image. Kristallografiia 8 no.2:174-180 Mr-Ap '63.  
(MIRA 17:8)

1. Institut kristallografi AN SSSR.

VAYNSHTEYN, B. K.; ZVYAGIN, B. B.

"Connection of lattice symmetry and generalized symmetry in reciprocal space."

report submitted for 6th Gen Assembly, Intl Union of Crystallography, Rome,  
9 Sep 63.

Inst of Crystallography, AS USSR, Moscow.

VAYNSSTEYN, B.K.

Bonding matrix of structural amplitudes. Kristallografia 9  
no.1:7-19 Ja-F '64. (MIRA 17:3)

1. Institut kristallografiia AN SSSR.

VAYNSTEYN, B.K.; CHISTYAKOV, I.G.

X-ray study of the structure of liquid crystals with the aid of the distribution function. Dokl. AN SSSR 153 no.2:326-329 N '63.  
(MIRA 16:12)

1. Chlen-korrespondent AN SSSR (for Vaynshteyn).

УЧЕБНИК

MOSKALEVICH, Vladimir Vladimirovich; VAINSHTEIN, Boris Mikhaylovich;  
RASTOKIN, Viktor Georgievich; SOKULIN, Aleksey Igant'yevich  
KARAMYSHEV, I.A., inzhener, redaktor; BOBROVA, Ye.N., tekhnicheskiy redaktor

[Building apartment houses of large silicate blocks; practices of the Road Construction and Road Planning Trusts of the Volga highway]  
Stroitel'stvo zhilykh domov iz krupnykh silikatnykh blokov; opyt Dorstroia i Dorproekta Privilzhskoi dorogi. Moskva, Gos.transp. zhel-dor. izd-vo, 1957. 31 p.  
(Apartment houses)

VAYNSHTEYN, Boris Natanovich; SUKMANOV, V.F., red.; KHANZHIN, G.P.,  
red.; SUKMANOVA, K.G., tekhn. red.

[Efficient designs of cutting tools and cutters] Ratsional'-  
nye konstruktsii reztsov i frez. Perm', Permskoe knizhnoe izd-  
vo, 1962. 40 p. (MIRA 15:11)  
(Metal-cutting tools)

AID P - 4860

Subject : USSR/Engineering

Card 1/1 Pub. 103 - 20/26

Author : Vaynshteyn, B. N.

Title : Face milling cutters with increased number of blades

Periodical : Stan. i instr., 2, 40-41, F 1956

Abstract : A description of construction and handling of new face milling cutters with 16 and up to 32 detachable blades, designed by Pomazkin, K. S., is given in a concise form. Three drawings, 1 photo and 1 table.

Institution : None

Submitted : No date

VAYNSSTEIN, Boris Natanovich, inzh.; KHAVKIN, P.A., red.;  
SUKHANOVA, K.G., tekhn. red.

[Cutting tools for machining holes] Instrumenty dlia ob-  
rabotki otverstii. Perm', Permskoe knizhnoe izd-vo,  
(MIRA 17:3)  
1962. 53 p.

ARTYUKHOVA, A.A., inzh.; VAYNSHTEYN, B.N., inzh.; KOGOSOV, L.P., inzh.;  
KIZIKOV, E.D., inzh.; PEPEVOZNIKOV, V.N., inzh.

Honing aluminum alloys, chromium platings and cast iron with  
synthetic diamond bars. Mashinostroenie no.5:18-20 S-0 '65.  
(MIRA 18:9)

VAYNSHTEYN, J. +

Catalysis for beta-lactamase synthesis  
by Parcetamol and Vancomycin in Streptomyces luteus  
B. P. Valsarajpala  
1947  
addn of lutein to Streptomyces luteus in medium with koalin being the carrier of the catalyst the products are reproducible and the higher proportion of lutein in the products than the lutein in the medium is the evidence of the presence of the catalyst in the medium in the lutein is close to 100% in size and shape and the lutein in the medium is in the liquid fraction

U.S. Tech Trans R-9

USSR/Kinetics - Combustion. Explosions. Topochemistry. Catalysis. B-9

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18632

Author : B.P. Vaynshteyn, Ye.A. Plokhinskaya, I.B. Rapoport.  
Title : Influence of Alkaline Additions on Activity and  
Selectivity of Iron-Copper Catalysts. Report I.

Orig Pub : Khimiya i tekhnol topliva, 1956, No 8, 31-35  
Inst : Vsesoyuznyy Nauchno-issledovatel'skiy institut Neftyaney pre-  
myshlennosti.

Abstract : The activity of precipitated iron-copper catalysts (2 to  
10% of Cu) in the synthesis reaction of hydrocarbons of  
CO and H<sub>2</sub> depending on the content of added silicate com-  
pounds (I) or MgO in the catalysts was investigated at  
212 to 218° and the gauge pressure of 10 atm. The yield  
of oil and paraffins contained in it rises, if the addi-  
tion of I was increased by 10 to 20%. Catalysts contain-  
ning 2 to 5% of Cu and 15 to 20% of I showed a high acti-  
vity and stability (2800 hours) and yielded a higher  
amount of liquid and solid hydrocarbons than catalysts  
with a greater Cu content. Introduction of MgO instead

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sov/ 65-58-6-12/13

AUTHORS: Vaynshteyn, B. P.; Rapoport, I. B. and Plokhinskaya, Ye. A.

TITLE: Investigations of Conditions for the Reduction of an Iron-Copper Catalyst. (K voprosu ob usloviyakh vosstanovleniya zhelezo-mednogo katalizatora).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr.6. pp. 65 - 70. (USSR).

ABSTRACT: Experiments were carried out and results are given for the reduction of precipitated iron-copper catalysts which are used for the synthesis of hydrocarbons from  $\text{CO}_2$  and hydrogen. Reduction was carried out at volume rates of 900 - 6,000 hours<sup>-1</sup> when the reduction was carried out with synthesis gas from 0.5 - 36 hours, and with hydrogen at volume rate of 3,000 hours<sup>-1</sup> for varying lengths of time. Investigations were also carried out on the dynamics of decomposition of hydrocarbonates, carbonates and hydrates of metals of the catalyst when heating up to a temperature of reduction. The latter experiments were carried out in conjunction with I. V. Malyshevaya. The catalysts were heated up to reduction temperatures in a current of synthesis gas, hydrogen or nitrogen. It was found that the maximum quantity of  $\text{CO}_2$  was separated at 170° - 180°C (Fig.1). The quantity of water

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SOV/ 65-58-6-12/13

## Investigations of Conditions for the Reduction of an Iron-Copper Catalyst.

separated during the heating of the catalyst to 230°C in a current of hydrogen or nitrogen was shown to be practically equal (Fig.2). It can be observed that the activity of samples of the catalyst heated up to the temperature of reduction in a current of a gas mixture and nitrogen decreases (Fig.3). The effect of the time of reduction of the catalyst in a current of synthesis gas on its activity was investigated. When the time of reduction was increased from 0.5 to 12 hours the yield of synthesis products increased (Fig.4). Results of the effect of various volume rates on the activity of the catalyst show that catalysts, reduced at volume rates of 1500 - 3,000 hours<sup>-1</sup> were most active (Fig.5). Tables 1 and 2 give the fractional composition of the synthesis products prepared with the investigated samples of catalysts. Table 3: the dependence of the activity of the catalysts on the time and temperature of reduction at the volume rate of 3,000 hours<sup>-1</sup>. It was shown that an increase in the temperature of reduction of the catalyst with hydrogen to 250°C makes it possible to reduce the length of the reduction process from 24 to 6 hours whilst maintaining the normal activity

Card 2/3

SOV/65-58-6-12/13

Investigations on Conditions for the Reduction of an Iron-Copper Catalyst.

of the catalyst. Further experiments were carried out on the effect of water vapour on the activity of iron-copper catalysts. These experiments were carried out together with V. P. Khokhlov. The reduction was carried out at  $250^{\circ}\text{C}$ , at atmospheric pressure, when the volume rate of hydrogen =  $3,000 \text{ hours}^{-1}$ . It was found that the period of processing of 8 - 12 hours at  $225^{\circ}\text{C}$  gave best results. During this time the  $\text{CO}_2$  content in the outlet gas = 28% - 34%, which corresponds to a 78% - 82% process of CO. Fig. 6: the dependence of the activity of the catalyst on the moisture content in the hydrogen, used during the reduction. The moisture content should not be higher than  $0.2 - 0.3 \text{ g/m}^3$ . There are 6 Figures and 3 Tables.

ASSOCIATION: VNII NP.

Card 3/3

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VAYNSSTEYN, B. R.

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VAYNSHTEYN, B.R., kand.med.nauk (Moskva)

Improving the quality of a thermoplastic impression mass. Stomatologija  
40 no.1:103 Ja-F '61. (MIRÄ 14:5)  
(DENTAL MATERIALS)

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New norms for overhead expenses and reduction of construction costs.  
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tekhn.red.

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Moskva, Otdel nauchno-tekhn. informatsii, 1957. 31 p. (MIRA 12:2)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut po  
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2. Rukovoditel' laboratorii ekonomiki Vsesoyuznogo nauchno-issle-  
dovatel'skogo instituta po stroitel'stvu ob'yektor naftyanoj i  
gazovoy promyshlennosti (for Vaynshteyn). 3. Starshiy inzhener  
Vsesoyuznogo nauchno-issledovatel'skogo instituta po stroitel'stvu  
ob'yektor naftyanoj i gazovoy promyshlennosti (for Kiyevskiy).  
(Petroleum industry) (Building)

VAYNSHTEYN, B.S. (Moskva)

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(Construction industry)

VAYNSHTEYN, Boris Samoylovich; AREF'YEVA, Nina Andreyevna; USPENSKIY, V.V., red.; MOHSKOY, K.L., red. izd-va.; EL'KINA, E.M., tekhn. red.

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[Problems in the economic effectiveness of capital investments and of new techniques in building] Voprosy ekonomiceskoi effektivnosti kapital'nykh vlozhenii i novoi tekhniki v stroitel'stve. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit.materialam, 1959. 252 p. (MIRA 12:5)

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(Construction industry--Finance)

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1. Rukovoditel' laboratorii Nauchno-issledovatel'skogo  
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(Electric engineering--Safety measures)

VAYNSHTEYN, B.Z., inzhener; GOL'TSMAN, V.G., inzhener; MINKEVITS, E.G.,  
inzhener; TSYKHKANSKIY, Yu. L., inzhener; LEBEDEVA, V.I., inzhener.

Replies to N.F. Burzhinskii's article "Articles from protection  
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Results of the work of the Electric Machine Section of the  
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VAYNSHTBYN, B.Z., inzhener.

Electrical engineering laboratories are needed for the railroads.  
Elek. i tepl. tiaga no. 4:46 Ap '57. (MLRA 10:6)

1. Nachal'nik tekhnicheskogo otdela sluzhby elektrifikatsii i  
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(Railroad research)

VAYNSHTEYN, B.Z., inzhener.

On the level of testing tension and periodicity of testing high  
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no.9:48-50 S '57. (MIRA 10:11)  
(Electric machines--Testing)

VAYNSHTEYN, B.Z., (g. Tbilisi)

Vital problems in safety techniques. Elek. i topl.tiaga 2 no.4:16-17  
Ap '58. (MIRA 12:3)

1. Nachal'nik tekhnicheskogo otdela sluzhby elektrifikatsii i ener-  
geticheskogo khozyaystva Zakavkazskoy dorogi.  
(Electric railroads--Safety appliances)

VAYNSHTEIN, B.Z., inzh.

Installation of High-voltage switchgear" by P.V. Kuznetsov. Reviewed  
by B.Z. Vainshtein. Elek. sta. 29 no.4:95-96 Ap '58. (MIRA 11:8)  
(Electric switchgear)  
(Kuznetsov, P.V.)

AUTHOR: Vaynshteyn, B. Z., Engineer SOV/91-59-2-20/33

TITLE: The Control of the Work of the Grid Circuit of the Control Cabinets for Mercury-Arc Rectifiers RMNV-500x6.  
(Kontrol' raboty setochnoy tsepi shkafov upravleniya rtutnymi vypryamitelyami RMNV-500x 6)

PERIODICAL: Energetik, 1959, Nr 2, pp 28 - 29 (USSR)

ABSTRACT: The existing grid control scheme of the cabinet ShRV has no instruments controlling the performance of grids of the RMNV-500x6 mercury-arc rectifier, so that some elements of the circuit can cease operation undetected. The author introduces a slight innovation implemented in 1956, that showed good reliability and enabled the substation's duty personnel to exercise better control over the work of the above named appliance. There is one diagram.

Card 1/1

AUTHOR: Vaynshteyn, B.Z., Engineer SOV/110-59-2-21/21

TITLE: Useful Information about Alternating Current Electric Locomotives (Poleznoye rukovodstvo po eleketrovozam peremennogo toka)

PERIODICAL: Vestnik Elektropromyshlennosti, 1959, Nr 2, pp 79-80 (USSR)

ABSTRACT: This is a review of a book by B.N. Tikhmenev, entitled 'Alternating Current Electric Locomotives with Static Rectifiers', published by Transzheldorizdat, 1958, 267 pp. A general description of the contents of the book is given; the review is generally favourable, the only adverse comment being that the edition (3000 copies) is too small.

Card 1/1

USCOMM-DC-60,513

VAYNSHTEYN, B.Z., inzh. (Tbilisi)

Ways of lowering the costs of power supply equipment. Elek. i tepl.  
tiaga 3 no.2:22-23 F '59. (MIRA 12:4)  
(Electric railroads--Substations--Equipment and supplies)  
(Electric railroads--Cost of construction)

VAYNSHTEYN, B.Z.

Possibilities for saving electric power on electric railroads.  
Prom. energ. 14 no.1:20-24 Ja '59. (MIRA 12:1)

1.Zakavkazskaya zheleznaya doroga.  
(Electric railroads)

VAYNSHTEYN, B.Z., inzh.(Tbilisi)

Improve labor organization on contact network divisions. Zhelez. dor.  
transp. 41 no.6:77 Je '59. (MIRA 12:9)  
(Electric railroads--Wires and wiring--Maintenance and repair)